



# **Ursa Operating Company, LLC**

**Rockies Region**

**CSF E**

**CSF E 23D-09-07-91**

**Wellbore #1**

**Plan: Design #1**

## **Ursa Operating Company LLC Planning Report**

**04 December, 2014**



<b>Company:</b> Ursa Operating Company, LLC <b>Project:</b> Rockies Region <b>Site:</b> CSF E <b>Well:</b> CSF E 23D-09-07-91 <b>Wellbore:</b> Wellbore #1 <b>Design:</b> Design #1	<b>Local Co-ordinate Reference:</b> Well CSF E 23D-09-07-91 <b>TVD Reference:</b> CSF E 23D-09-07-91 @ 6821.4usft (PAD Est KB) <b>MD Reference:</b> CSF E 23D-09-07-91 @ 6821.4usft (PAD Est KB) <b>North Reference:</b> True <b>Survey Calculation Method:</b> Minimum Curvature <b>Database:</b> MasterDB
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<b>Project</b>	Rockies Region		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Central Zone		

<b>Site</b>	CSF E			
<b>Site Position:</b>	<b>Northing:</b>	1,600,196.55 usft	<b>Latitude:</b>	39° 27' 47.492 N
<b>From:</b> Lat/Long	<b>Easting:</b>	2,418,195.90 usft	<b>Longitude:</b>	107° 33' 39.189 W
<b>Position Uncertainty:</b> 0.0 usft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b>	-1.30 °

<b>Well</b>	CSF E 23D-09-07-91, SHL LAT: 39.458581333 LONG: -107.558805505					
<b>Well Position</b>	<b>+N/-S</b>	0.0 usft	<b>Northing:</b>	1,598,504.17 usft	<b>Latitude:</b>	39° 27' 30.893 N
	<b>+E/-W</b>	0.0 usft	<b>Easting:</b>	2,418,745.00 usft	<b>Longitude:</b>	107° 33' 31.700 W
<b>Position Uncertainty</b>		0.0 usft	<b>Wellhead Elevation:</b>	6,821.4 usft	<b>Ground Level:</b>	6,806.0 usft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	12/4/2014	9.70	65.69	51,928

<b>Design</b>	Design #1				
<b>Audit Notes:</b>					
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b>	0.0	
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.0	0.0	0.0	272.99	

<b>Survey Tool Program</b>	Date 12/4/2014				
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
0.0	7,451.2	Design #1 (Wellbore #1)	MWD	MWD - Standard	

<b>Company:</b>	Ursa Operating Company, LLC	<b>Local Co-ordinate Reference:</b>	Well CSF E 23D-09-07-91
<b>Project:</b>	Rockies Region	<b>TVD Reference:</b>	CSF E 23D-09-07-91 @ 6821.4usft (PAD Est KB)
<b>Site:</b>	CSF E	<b>MD Reference:</b>	CSF E 23D-09-07-91 @ 6821.4usft (PAD Est KB)
<b>Well:</b>	CSF E 23D-09-07-91	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Design #1	<b>Database:</b>	MasterDB

**Planned Survey**

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
0.0	0.00	0.00	0.0	-6,821.4	0.0	0.0	0.0	0.00	1,598,504.17	2,418,745.00
100.0	0.00	0.00	100.0	-6,721.4	0.0	0.0	0.0	0.00	1,598,504.17	2,418,745.00
200.0	0.00	0.00	200.0	-6,621.4	0.0	0.0	0.0	0.00	1,598,504.17	2,418,745.00
300.0	0.00	0.00	300.0	-6,521.4	0.0	0.0	0.0	0.00	1,598,504.17	2,418,745.00
400.0	0.00	0.00	400.0	-6,421.4	0.0	0.0	0.0	0.00	1,598,504.17	2,418,745.00
500.0	0.00	0.00	500.0	-6,321.4	0.0	0.0	0.0	0.00	1,598,504.17	2,418,745.00
600.0	0.00	0.00	600.0	-6,221.4	0.0	0.0	0.0	0.00	1,598,504.17	2,418,745.00
700.0	0.00	0.00	700.0	-6,121.4	0.0	0.0	0.0	0.00	1,598,504.17	2,418,745.00
800.0	0.00	0.00	800.0	-6,021.4	0.0	0.0	0.0	0.00	1,598,504.17	2,418,745.00
900.0	0.00	0.00	900.0	-5,921.4	0.0	0.0	0.0	0.00	1,598,504.17	2,418,745.00
1,000.0	0.00	0.00	1,000.0	-5,821.4	0.0	0.0	0.0	0.00	1,598,504.17	2,418,745.00
1,100.0	0.00	0.00	1,100.0	-5,721.4	0.0	0.0	0.0	0.00	1,598,504.17	2,418,745.00
<b>Surface Casing</b>										
1,200.0	0.00	0.00	1,200.0	-5,621.4	0.0	0.0	0.0	0.00	1,598,504.17	2,418,745.00
1,300.0	0.00	0.00	1,300.0	-5,521.4	0.0	0.0	0.0	0.00	1,598,504.17	2,418,745.00
<b>Start Build 3.00</b>										
1,400.0	3.00	272.99	1,400.0	-5,421.4	0.1	-2.6	2.6	3.00	1,598,504.37	2,418,742.39
1,500.0	6.00	272.99	1,499.6	-5,321.8	0.5	-10.4	10.5	3.00	1,598,504.96	2,418,734.57
1,600.0	9.00	272.99	1,598.8	-5,222.6	1.2	-23.5	23.5	3.00	1,598,505.93	2,418,721.55
1,638.2	10.15	272.99	1,636.5	-5,184.9	1.6	-29.8	29.9	3.00	1,598,506.41	2,418,715.21
<b>Start 2917.7 hold at 1638.2 MD</b>										
1,700.0	10.15	272.99	1,697.3	-5,124.1	2.1	-40.7	40.8	0.00	1,598,507.22	2,418,704.36
1,800.0	10.15	272.99	1,795.7	-5,025.7	3.0	-58.3	58.4	0.00	1,598,508.54	2,418,686.79
1,900.0	10.15	272.99	1,894.1	-4,927.3	4.0	-75.9	76.0	0.00	1,598,509.85	2,418,669.22
2,000.0	10.15	272.99	1,992.6	-4,828.8	4.9	-93.5	93.6	0.00	1,598,511.17	2,418,651.65
2,100.0	10.15	272.99	2,091.0	-4,730.4	5.8	-111.1	111.2	0.00	1,598,512.49	2,418,634.09
2,200.0	10.15	272.99	2,189.4	-4,632.0	6.7	-128.7	128.8	0.00	1,598,513.80	2,418,616.52
2,300.0	10.15	272.99	2,287.9	-4,533.5	7.6	-146.3	146.5	0.00	1,598,515.12	2,418,598.95

<b>Company:</b>	Ursa Operating Company, LLC	<b>Local Co-ordinate Reference:</b>	Well CSF E 23D-09-07-91
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<b>Site:</b>	CSF E	<b>MD Reference:</b>	CSF E 23D-09-07-91 @ 6821.4usft (PAD Est KB)
<b>Well:</b>	CSF E 23D-09-07-91	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Design #1	<b>Database:</b>	MasterDB

### Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
2,400.0	10.15	272.99	2,386.3	-4,435.1	8.6	-163.9	164.1	0.00	1,598,516.44	2,418,581.38
2,500.0	10.15	272.99	2,484.8	-4,336.6	9.5	-181.4	181.7	0.00	1,598,517.75	2,418,563.81
2,600.0	10.15	272.99	2,583.2	-4,238.2	10.4	-199.0	199.3	0.00	1,598,519.07	2,418,546.24
2,700.0	10.15	272.99	2,681.6	-4,139.8	11.3	-216.6	216.9	0.00	1,598,520.39	2,418,528.67
2,800.0	10.15	272.99	2,780.1	-4,041.3	12.2	-234.2	234.6	0.00	1,598,521.70	2,418,511.11
2,900.0	10.15	272.99	2,878.5	-3,942.9	13.1	-251.8	252.2	0.00	1,598,523.02	2,418,493.54
3,000.0	10.15	272.99	2,976.9	-3,844.5	14.1	-269.4	269.8	0.00	1,598,524.34	2,418,475.97
3,100.0	10.15	272.99	3,075.4	-3,746.0	15.0	-287.0	287.4	0.00	1,598,525.65	2,418,458.40
3,119.3	10.15	272.99	3,094.4	-3,727.0	15.2	-290.4	290.8	0.00	1,598,525.91	2,418,455.00
<b>Williams Fork</b>										
3,200.0	10.15	272.99	3,173.8	-3,647.6	15.9	-304.6	305.0	0.00	1,598,526.97	2,418,440.83
3,300.0	10.15	272.99	3,272.2	-3,549.2	16.8	-322.2	322.6	0.00	1,598,528.29	2,418,423.26
3,400.0	10.15	272.99	3,370.7	-3,450.7	17.7	-339.8	340.3	0.00	1,598,529.60	2,418,405.69
3,500.0	10.15	272.99	3,469.1	-3,352.3	18.7	-357.4	357.9	0.00	1,598,530.92	2,418,388.13
3,600.0	10.15	272.99	3,567.5	-3,253.9	19.6	-375.0	375.5	0.00	1,598,532.24	2,418,370.56
3,700.0	10.15	272.99	3,666.0	-3,155.4	20.5	-392.6	393.1	0.00	1,598,533.55	2,418,352.99
3,800.0	10.15	272.99	3,764.4	-3,057.0	21.4	-410.2	410.7	0.00	1,598,534.87	2,418,335.42
3,900.0	10.15	272.99	3,862.9	-2,958.5	22.3	-427.8	428.3	0.00	1,598,536.19	2,418,317.85
4,000.0	10.15	272.99	3,961.3	-2,860.1	23.2	-445.4	446.0	0.00	1,598,537.50	2,418,300.28
4,100.0	10.15	272.99	4,059.7	-2,761.7	24.2	-463.0	463.6	0.00	1,598,538.82	2,418,282.71
4,200.0	10.15	272.99	4,158.2	-2,663.2	25.1	-480.5	481.2	0.00	1,598,540.14	2,418,265.15
4,300.0	10.15	272.99	4,256.6	-2,564.8	26.0	-498.1	498.8	0.00	1,598,541.45	2,418,247.58
4,400.0	10.15	272.99	4,355.0	-2,466.4	26.9	-515.7	516.4	0.00	1,598,542.77	2,418,230.01
4,500.0	10.15	272.99	4,453.5	-2,367.9	27.8	-533.3	534.1	0.00	1,598,544.09	2,418,212.44
4,555.9	10.15	272.99	4,508.5	-2,312.9	28.3	-543.2	543.9	0.00	1,598,544.82	2,418,202.61
<b>Start Drop -3.00</b>										
4,600.0	8.83	272.99	4,552.0	-2,269.4	28.7	-550.4	551.2	3.00	1,598,545.37	2,418,195.37

<b>Company:</b>	Ursa Operating Company, LLC	<b>Local Co-ordinate Reference:</b>	Well CSF E 23D-09-07-91
<b>Project:</b>	Rockies Region	<b>TVD Reference:</b>	CSF E 23D-09-07-91 @ 6821.4usft (PAD Est KB)
<b>Site:</b>	CSF E	<b>MD Reference:</b>	CSF E 23D-09-07-91 @ 6821.4usft (PAD Est KB)
<b>Well:</b>	CSF E 23D-09-07-91	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Design #1	<b>Database:</b>	MasterDB

**Planned Survey**

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
4,700.0	5.83	272.99	4,651.2	-2,170.2	29.4	-563.2	563.9	3.00	1,598,546.32	2,418,182.66
4,800.0	2.83	272.99	4,750.9	-2,070.5	29.8	-570.7	571.5	3.00	1,598,546.88	2,418,175.14
4,894.2	0.00	0.00	4,845.0	-1,976.4	29.9	-573.0	573.8	3.00	1,598,547.06	2,418,172.82
<b>Back to Vertical - Start 2557.0 hold at 4894.2 MD</b>										
4,894.6	0.00	0.00	4,845.4	-1,976.0	29.9	-573.0	573.8	0.00	1,598,547.06	2,418,172.82
<b>Top of Gas</b>										
4,900.0	0.00	0.00	4,850.8	-1,970.6	29.9	-573.0	573.8	0.00	1,598,547.06	2,418,172.82
5,000.0	0.00	0.00	4,950.8	-1,870.6	29.9	-573.0	573.8	0.00	1,598,547.06	2,418,172.82
5,100.0	0.00	0.00	5,050.8	-1,770.6	29.9	-573.0	573.8	0.00	1,598,547.06	2,418,172.82
5,200.0	0.00	0.00	5,150.8	-1,670.6	29.9	-573.0	573.8	0.00	1,598,547.06	2,418,172.82
5,300.0	0.00	0.00	5,250.8	-1,570.6	29.9	-573.0	573.8	0.00	1,598,547.06	2,418,172.82
5,400.0	0.00	0.00	5,350.8	-1,470.6	29.9	-573.0	573.8	0.00	1,598,547.06	2,418,172.82
5,500.0	0.00	0.00	5,450.8	-1,370.6	29.9	-573.0	573.8	0.00	1,598,547.06	2,418,172.82
5,600.0	0.00	0.00	5,550.8	-1,270.6	29.9	-573.0	573.8	0.00	1,598,547.06	2,418,172.82
5,700.0	0.00	0.00	5,650.8	-1,170.6	29.9	-573.0	573.8	0.00	1,598,547.06	2,418,172.82
5,800.0	0.00	0.00	5,750.8	-1,070.6	29.9	-573.0	573.8	0.00	1,598,547.06	2,418,172.82
5,894.6	0.00	0.00	5,845.4	-976.0	29.9	-573.0	573.8	0.00	1,598,547.06	2,418,172.82
<b>Cameo</b>										
5,900.0	0.00	0.00	5,850.8	-970.6	29.9	-573.0	573.8	0.00	1,598,547.06	2,418,172.82
6,000.0	0.00	0.00	5,950.8	-870.6	29.9	-573.0	573.8	0.00	1,598,547.06	2,418,172.82
6,100.0	0.00	0.00	6,050.8	-770.6	29.9	-573.0	573.8	0.00	1,598,547.06	2,418,172.82
6,200.0	0.00	0.00	6,150.8	-670.6	29.9	-573.0	573.8	0.00	1,598,547.06	2,418,172.82
6,300.0	0.00	0.00	6,250.8	-570.6	29.9	-573.0	573.8	0.00	1,598,547.06	2,418,172.82
6,400.0	0.00	0.00	6,350.8	-470.6	29.9	-573.0	573.8	0.00	1,598,547.06	2,418,172.82
6,500.0	0.00	0.00	6,450.8	-370.6	29.9	-573.0	573.8	0.00	1,598,547.06	2,418,172.82
6,600.0	0.00	0.00	6,550.8	-270.6	29.9	-573.0	573.8	0.00	1,598,547.06	2,418,172.82
6,700.0	0.00	0.00	6,650.8	-170.6	29.9	-573.0	573.8	0.00	1,598,547.06	2,418,172.82
6,800.0	0.00	0.00	6,750.8	-70.6	29.9	-573.0	573.8	0.00	1,598,547.06	2,418,172.82

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<b>Site:</b> CSF E	<b>MD Reference:</b> CSF E 23D-09-07-91 @ 6821.4usft (PAD Est KB)
<b>Well:</b> CSF E 23D-09-07-91	<b>North Reference:</b> True
<b>Wellbore:</b> Wellbore #1	<b>Survey Calculation Method:</b> Minimum Curvature
<b>Design:</b> Design #1	<b>Database:</b> MasterDB

Planned Survey										
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
6,900.0	0.00	0.00	6,850.8	29.4	29.9	-573.0	573.8	0.00	1,598,547.06	2,418,172.82
7,000.0	0.00	0.00	6,950.8	129.4	29.9	-573.0	573.8	0.00	1,598,547.06	2,418,172.82
7,100.0	0.00	0.00	7,050.8	229.4	29.9	-573.0	573.8	0.00	1,598,547.06	2,418,172.82
7,151.6	0.00	0.00	7,102.4	281.0	29.9	-573.0	573.8	0.00	1,598,547.06	2,418,172.82
<b>Rollins</b>										
7,200.0	0.00	0.00	7,150.8	329.4	29.9	-573.0	573.8	0.00	1,598,547.06	2,418,172.82
7,300.0	0.00	0.00	7,250.8	429.4	29.9	-573.0	573.8	0.00	1,598,547.06	2,418,172.82
7,400.0	0.00	0.00	7,350.8	529.4	29.9	-573.0	573.8	0.00	1,598,547.06	2,418,172.82
7,451.2	0.00	0.00	7,402.0	580.6	29.9	-573.0	573.8	0.00	1,598,547.06	2,418,172.82
<b>TD at 7451.2</b>										

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
3,119.3	3,094.4	Williams Fork		0.00		
4,894.6	4,845.4	Top of Gas		0.00		
5,894.6	5,845.4	Cameo		0.00		
7,151.6	7,102.4	Rollins		0.00		

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<b>Site:</b>	CSF E	<b>MD Reference:</b>	CSF E 23D-09-07-91 @ 6821.4usft (PAD Est KB)
<b>Well:</b>	CSF E 23D-09-07-91	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Design #1	<b>Database:</b>	MasterDB

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
1,100.0	1,100.0	0.0	0.0	Surface Casing	
1,300.0	1,300.0	0.0	0.0	Start Build 3.00	
1,638.2	1,636.5	1.6	-29.8	Start 2917.7 hold at 1638.2 MD	
4,555.9	4,508.5	28.3	-543.2	Start Drop -3.00	
4,894.2	4,845.0	29.9	-573.0	Back to Vertical	
4,894.2	4,845.0	29.9	-573.0	Start 2557.0 hold at 4894.2 MD	
7,451.2	7,402.0	29.9	-573.0	TD at 7451.2	

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_



Well Name: CSF E 23D-09-07-91  
 Surface Location: CSF E  
 North American Datum 1983, US State Plane 1983, Colorado Central Zone  
 Ground Elevation: 6806.0  
 +N/-S +E/-W Northing Easting Latitude Longitude Slot  
 0.0 0.0 1598504.17 2418745.00 39° 27' 30.893 N 107° 33' 31.700 W  
 PAD Est KB CSF E 23D-09-07-91 @ 6821.4usft (PAD Est KB)



Azimuths to True North  
 Magnetic North: 9.70°  
 Magnetic Field  
 Strength: 51928.1snT  
 Dip Angle: 65.69°  
 Date: 12/4/2014  
 Model: IGRF2010

CSF E  
 CSF E 23D-09-07-91  
 Design #1  
 11:03, December 04 2014

WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
23D-09-07-91 TGT4845.0		29.9	-573.0	1598547.06	2418172.82	39° 27' 31.188 N	107° 33' 39.006 W	Rectangle (Sides: L40.0 W100.0)

ANNOTATIONS

TVD	MD	Annotation
1100.0	1100.0	Surface Casing
1300.0	1300.0	Start Build 3.00
1636.5	1638.2	Start 2917.7 hold at 1638.2 MD
4508.5	4555.9	Start Drop -3.00
4845.0	4894.2	Back to Vertical
4845.0	4894.2	Start 2557.0 hold at 4894.2 MD
7402.0	7451.2	TD at 7451.2

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	1300.0	0.00	0.00	1300.0	0.0	0.0	0.00	0.00	0.0	
3	1638.2	10.15	272.99	1636.5	-1.6	-29.8	3.00	272.99	29.9	
4	4555.9	10.15	272.99	4508.5	28.3	-543.2	0.00	0.00	543.9	
5	4894.2	0.00	0.00	4845.0	29.9	-573.0	3.00	180.00	573.8	23D-09-07-91 TGT
6	7451.2	0.00	0.00	7402.0	29.9	-573.0	0.00	0.00	573.8	

FORMATION TOP DETAILS

TVDPATH	MDPATH	Formation	DipAngle	DipDir
3094.4	3119.3	Williams Fork	0.00	
4845.4	4894.6	Top of Gas	0.00	
5845.4	5894.6	Cameo	0.00	
7102.4	7151.6	Rollins	0.00	

